

CLAIMS

What is claimed is:

- 1 1. A method of inducing immune tolerance to an antigen in a mammal,
2 comprising:
3 (a) administering an engineered population of white blood cells that express
4 an antigen to a mammal one or more times thereby inducing at least partial immune tolerance of
5 the antigen in the mammal.
- 1 2. The method of claim 1 further comprising:
2 (b) engineering a population of white blood cells to express the antigen.
- 1 3. The method of claim 2 further comprising:
2 (c) obtaining the population of white blood cells from the individual prior to
3 (b).
- 1 4. The method of claim 2 wherein (b) comprises inserting a nucleic acid
2 encoding the portion of the antigen or a nucleic acid that encodes an enzyme capable of
3 producing part of the antigen into the white blood cells.
- 1 5. The method of claim 4 wherein the nucleic acid encoding the portion of
2 the antigen or a nucleic acid that encodes an enzyme capable of producing part of the antigen is
3 inserted into the white blood cells by a replication defective adenovirus.
- 1 6. The method of claim 1 wherein the antigen is a carbohydrate.
- 1 7. The method of claim 6 wherein the antigen is a blood group antigen.
- 1 8. The method of claim 7 wherein the blood group antigen is blood group A
2 antigen, blood group B antigen or both.

- 1 9. The method of claim 2 wherein (b) occurs *in vitro*.
- 1 10. A white blood cell produced by engineering the white blood cell to express
2 an antigen.
- 1 11. A pharmaceutical composition comprising the cell of claim 10.
- 1 12. The method of claim 1 further comprising:
2 (d) exposing the mammal to the antigen.
- 1 13. The method of claim 11 wherein (d) comprises transplanting a tissue
2 comprising the antigen into the mammal.
- 1 14. The method of claim 1 wherein the mammal is a human.
- 1 15. The method of claim 12 further comprising:
2 (e) measuring the immune reaction of the mammal to the antigen.
- 1 16. The method of claim 15 further comprising:
2 (f) comparing the immune reaction of the mammal to the antigen with the
3 immune reaction of a control mammal that had not been administered an engineered population
4 of white blood cells that express the antigen.
- 1 17. The method of claim 6 wherein the antigen comprises the α -gal epitope
2 [Gal α 1-3Gal β 1-(3)4GlcNAc-R].
- 1 18. The method of claim 1 wherein the mammal is essentially free of
2 circulating antibodies that react specifically with the antigen.
- 1 19. The method of claim 1 wherein the engineered white blood cells comprise
2 lymphocytes.